



## Laser peening shows its mettle

By Stephen Wampler

NEWSLINE STAFF WRITER

There's more life in store for critical components for commercial aircraft.

That's the result of an advanced laser peening technology developed by Laboratory researchers and a New Jersey firm.

The payoff is already proving to be huge: turbine engine parts that last longer, reduced maintenance costs, and annual savings of hundreds of millions of dollars.

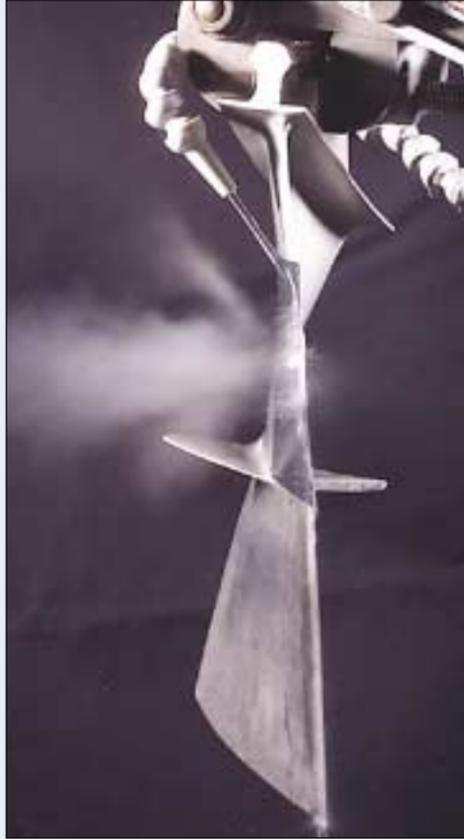
The breakthrough that provides these benefits is a powerful LLNL laser and shock generation technology used by Metal Improvement Co. Inc. of Paramus, N.J., to treat the surface of metal parts.

"This is 21st century technology that will enable engineers to design aircraft parts that are safer, lighter, perform better and are more economical," said Lloyd Hackel, leader of LLNL's Laser Science and Technology Program and Laboratory's initial developer of laser peening.

During the past 21 months, Rolls-Royce plc has used Metal Improvement to laser peen critical fan blade components installed in more than 250 Rolls-Royce Trent 800/Trent 500 engines.

There will be a press conference this morning to unveil the technology. Rep.

See **PEENING**, page 7



Laser peening induces deep compressive stress, which significantly extends the service lifetime over any conventional treatment.

## Two pairs of Lab scientists are selected to receive Edward Teller Fellowships

By Anne M. Stark

NEWSLINE STAFF WRITER

Four Lab scientists were presented last week with the fourth annual Edward Teller Fellowship awards during an informal ceremony in Bldg. 543.

The new fellows are Mike McCoy and Mark Seager of the Computation Directorate and Ben Santer and Ken Caldeira of the Energy and Environment Directorate.

Started in 2000 by then Director Bruce Tarter, the Edward Teller Fellowships were designed after the esteemed MacArthur Fellowships. The award allows the recipients to do a year's worth of self-directed work that will benefit the Laboratory.

"This is a marvelous idea that offers people the opportunity to make some special things happen," Director Michael Anastasio said to the award winners. "Hopefully, this will inspire you to do great things."

Unlike previous years, this year's recipients will be working as teams on their fellowship research.

"As director, you try to think of ways to reward people," Tarter said. "This takes the financial burden off of you for a while to do something interesting."

Under this fellowship, Seager and McCoy plan to recruit a computer architect to focus on analyzing technologies that might scale to petaFLOP/s-class systems (10 to the 15th operations per second, peak speed) and beyond. "The ultimate goal is to explore cluster and alternative technologies as one possible vehicles for petaFLOP/s-class systems later this decade," McCoy said.

See **TELLER AWARDS**, page 8

## Scientists iron out questions about conditions that exist at the Earth's inner core

By Anne M. Stark

NEWSLINE STAFF WRITER

Two Lab scientists have discovered that iron in Earth-core conditions melts at a pressure of 225 GPa (or 32 million pounds per square inch) or about 5,100 kelvins (8,720 degrees Fahrenheit).

Determining the melting point of iron is essential to determine the temperatures at core boundaries and the crystal structure of the Earth's solid inner core. To date, the properties of iron at high pressure have been investigated experimentally through laser-heated diamond anvil cells, shock compression techniques and theoretical calculations.

However, those techniques have not produced a consensus on the melt line or the high-pressure, high-temperature phase of iron in the inner core. Previous

See **IRON**, page 8

## Brown calls for effort to fulfill Dr. King's dream

By Don Johnston

NEWSLINE STAFF WRITER

In a Laboratory address celebrating the life of Martin Luther King Jr. Wednesday, former San Francisco Mayor Willie Brown Jr. extolled the remarkable achievements of the civil rights movement but said much still needs to be done to fulfill King's dream of equality.

Brown noted that in many respects, King's work has resulted in real opportunities and advances for African Americans, citing his own experience in

See **MLK**, page 5



JACQUELINE MCBRIDE/NEWSLINE

Former San Francisco Mayor Willie Brown reflects on Martin Luther King's legacy in an address to a packed Bldg. 123 auditorium.



Scholarship winners

— Page 3



Sound science makes a fellow

— Page 4



Changing of the guard

— Page 5



## LAB COMMUNITY NEWS

### Weekly Calendar

Technical Meeting Calendar, page 4

Saturday  
**24**

A scheduled power outage will occur today from 7 a.m. to 3 p.m. today in Bldg. 411 and Trailers 4161, 4180, 4181, 4182 and 4184. Air conditioning, heating and elevators also will be affected. For more information, contact Mark Cardoza, 3-0490.

Tuesday  
**27**

The first of five scheduled LLNL retirees travel slide shows will take place today at 2 p.m. in the Livermore Library meeting room. The show is titled: "Welcoming the Millenium: Angkor Wat and Nayanmar (Burma)," by Arlene and Stephen Chin. From January through April, the group will meet the fourth Tuesday at 2 p.m. in the Livermore Library meeting room. In May and June, the group will meet at 2 p.m. in the Livermore City Council chambers at 2675 Pacific Ave. For more information, contact Margy Odell, 449-7262.

Friday  
**30**

Staff members of the **Stanford ASCI Alliance Center** for Integrated Turbulence Studies will visit the Lab today. They will present results achieved as they pursue their ASCI objectives of simulating the multi-physics of reacting flow in gas turbines. They will also present their work on Stanford's new streaming supercomputer architecture. Stanford overviews will begin at 10:15 a.m. in the Bldg. 123 auditorium followed by breakout sessions on combustion, turbulence and computer architecture. Poster presentations will be in the West Cafeteria at 3:15 p.m.

UP  
&  
COMING

**LLESA's Body Challenge 2004** is a 12-week, Labwide employee health and fitness incentive program, that runs Feb. 9-April 30. Participants earn points by making healthy lifestyle choices in exercise, nutrition, stress reduction and health issues, and become eligible for prizes. You can participate individually or join the Directorate Team Competition. You do not have to be a member of LLESA's Fit for Business Program (FFB). You can learn more about the Body Challenge 2004 and get a free chair massage during lunch (11 a.m.-1 p.m.) Wednesday, Jan. 28, at the South Cafeteria, or get details by calling 2-9403, 2-7736, or 3-7659.

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A **fidelity retirement counselor** will be available Feb. 10-11 to assist with: assessing the current state of retirement accounts, learning how to plan asset allocation and diversify investments within retirement accounts, as well as identifying income strategies. Fidelity Mutual Funds are available to UC's workplace retirement plan participants in addition to the UC-managed investment pools. If you would like to set up a one-on-one consultation, call 800-642-7131. Be sure to specify that you are an LLNL employee.

### The art of interview



PHOTO BY PAMELA CAMPION/DUBLIN HIGH SCHOOL

Scott Wilson of the Lab's Public Affairs Office interviews Dublin High School senior Brandon Parkey during one of the mock job interviews in which 160 students and 37 business/community volunteers participated.

## IN MEMORIAM

### Burdon "Don" Musgrave

Burdon "Don" Musgrave died Dec. 21, his 74th birthday.

Born in Oberlin, Kansas, Musgrave served in the U. S. Air Force for 5 years. He received his Ph.D. from the University of Kansas and was a professor in the Chemistry Department at the University of Arkansas. He was manager for Technology Research and Development at the Idaho Chemical Processing Plant at INEL prior to coming to the Laboratory in 1979.

At LLNL Musgrave held leadership roles in nuclear systems safety and environmental protection,

as well as complex-wide waste management technology assessment and development. He also headed the Mixed Waste Treatment Project based at DOE-HQ.

After retiring, Musgrave was active in the Golden Gate Pembroke Welsh Corgi Club.

He is survived by his wife, Sara; daughter, Erin Robinson; sons, Matt and Ken; brother, Gale; and grandson, Ryan.

Contributions in his memory may be sent to Hope Hospice in Dublin.

### George Klein

George Duller Klein, an 11-year resident of Ripon, died Dec. 18. He was 69.

He was born Dec. 16, 1934, in Akron, Ohio. A Korean War veteran, he served in the U.S. Navy from 1952-55. Klein worked as a contract administrator for the Lab. A Notre Dame sports fan, he enjoyed fishing,

camping and caring for his two dogs and a cat.

He is survived by his wife, Maria; his children, Kyle Klein of Fontana and Casey Lockie of Glendora; his sisters, Bobbie Jenkins of Arizona and Judy Ballard of California; and three grandchildren.

Services have been held.

### Bettie Myers

Bettie Neath Myers, a lifelong resident of Livermore, died Dec. 24. She was 84.

Myers was born Oct. 4, 1919, in Oakland. She worked as a computer operator at the Lab from 1955-1982. After retirement, she worked as security escort from 1985 until her death.

She was an active member of St. Michael's Catholic Church and a senior group called the Sirettes of Livermore. She devoted much of her time to knit-

ting, cruising and traveling around the world.

She is survived by her sons, Ronald Myers and his wife, Bronwyn, of Boise, Idaho, and Roger Cromwell of Roseville; her brother, John Neath of Castro Valley; two grandchildren; and four great-grandchildren.

Services have been held.

## Newsline

Newsline is published weekly by the Internal Communications Department, Public Affairs Office, Lawrence Livermore National Laboratory (LLNL), for Laboratory employees and retirees.

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### James "Jim" Bradford Orr

James "Jim" Bradford Orr died Dec. 17 in Fort Collins, Colo. He was 87.

Born in Redlands, Calif., where he grew up and attended Redlands University, Orr met his wife Betty while a graduate student at UC Berkeley. During World War II, Orr served in the military as a meteorologist. After the war he worked as a geologist for the National Park Service in Mt. McKinley National Park, Alaska and Volcano National Park in Hawaii.

Returning to Berkeley, Orr worked as an industrial safety and fire protection engineer. After retiring from private industry in 1960, Orr worked at the Lab as a safety engineer in Hazards Control until 1973.

Orr was preceded in death by his wife of 56 years, Betty. He is survived by a daughter, Nora James of Fort Collins, Colo.

## AROUND THE LAB



# Women's association presents 10 scholarship awards

By Linda Lucchetti

NEWSLINE STAFF WRITER

The Lab Women's Association (LLLWA) presented its annual scholarship awards Jan. 15 to 10 Lab employees pursuing their formal education concurrently with their careers and inaugurated a new honorary award.

In her welcoming remarks, LLLWA President and past scholarship recipient, Chelle Clements acknowledged the association's 20th anniversary of awarding scholarships, a program often considered the organization's cornerstone. Over the past two decades, 198 scholarships have been awarded, totaling more than \$65,000.

This year, the association honored Joni Schuld, head of the Scholarship committee for 12 years and most recently special administrative assistant to Associate Director At Large Bruce Tarter, by creating a new award in her name: "The Joni Schuld Administrative Excellence Award." This new award is designed to honor a recipient who displays "academic merit, a dedication to the Laboratory's administrative excellence, high integrity and respect for the entire team."

The first recipient is Carol Lamee, a division leader in UTEL, who is completing her degree in business at Las Positas College and plans to go on for her four-year degree immediately following her AA.

During the ceremony, Edith Greene, a past scholarship recipient, inspired this year's winners with her story of progressing from secretary to resource analyst at the Lab. Greene thanked the association for aiding her and recogniz-



Winners of the LLLWA annual scholarship awards are, from top clockwise, Mark Carter, scholarship presenter and PAT associate director Tammy Jernigan, Carol Lamee, Brenda Staley, Patti Kluck, Christie Dixon, Adrienne Ridolfi, Alea Marain, Naomi Case and Yahel De La Cruz.

ing her efforts in obtaining her degree in business administration from Cal State Hayward last year.

"I am the first woman in three generations of my family to gain a college degree," Greene stated proudly. "Continue your education. The rewards you'll receive will be endless."

Tammy Jernigan, principal deputy associate director for Physics and Advanced Technologies, presented the awards to the winners. A former NASA astronaut who joined the Laboratory in 2001, Jernigan reflected on the choices and challenges she faced while completing her degree during the time she was selected into the astronaut program.

"It was a good test of my organizational management," she admitted. Jernigan applauded recipients not only for managing their careers and family life while pursuing their education, but also for serving as strong role models for youth in their families.

LLLWA Scholarship Committee members are Pat Chance, Carol Gerich, Charlene Grandfield, Luisa Hansen, Celeste Matarazzo, Barbara Sokolowski, Susan Springer and Becky Springmeyer. The committee selects recipients after evaluating their education history, transcripts,

goals and objectives, and conducting personal interviews.

Awards have been given to employees seeking associate's, bachelor's and master's degrees, and Ph.D.s In addition, the association has continually recognized those employees striving to complete a variety of career goals, such as gaining teacher credentials or passing their bar examinations. Funds for scholarships come from the association's membership dues, fundraisers, donations and the Administrative and Human Resource Directorate's Diversity and Worklife Programs.

## Scholarship winners represent cross section of the Lab

The following are this year's LLLWA scholarship winners:

Yahel De La Cruz, \$600 scholarship winner, is a software engineer in Laboratory Services/Administration Information Systems. She is pursuing a master's degree in information systems at the University of San Francisco.

Winners of \$500 scholarships are Alea Marain, an administrative specialist in Hazards Control, who is working toward a bachelor's degree in organizational behavior at the University of San Francisco; and Cherice Pitman, a senior resource manager in NIF, who is working towards a bachelor's degree in business management at Saint Mary's College.

Winners of \$400 scholarships are Christie Dixon, an administrative specialist in Safeguards and Security/Protective Division, who is working towards an associate's degree in graphic design at Las Positas Community College; Patti Kluck, a health and safety technologist in Hazards Control, who is seeking a bachelor's degree in organizational behavior from the University of San Francisco; Carol Lamee, a ser-

vice operations division leader in Laboratory Services/UTEL who is seeking an associate's degree in business at Las Positas Community College; and Brenda Staley, a safety document coordinator in Hazards Control, who is seeking a bachelor's degree in organizational behavior at the University of San Francisco.

Winners of \$350 scholarships are Mark Carter, a computer information specialist in the Procurement Department, who is transitioning to the University of San Francisco and seeking a degree in computer information systems; and Naomi Case, an administrative specialist in Hazards Control who is seeking a bachelor's degree in organizational behavior from the University of San Francisco and plans to continue her education to earn a master's degree in environmental studies.

Winner of a \$300 scholarship award is Adrienne Ridolfi, an administrative specialist in Energy and Environment/ Environmental Science, who is pursuing a certificate in graphics design from Las Positas Community College.

## BRIEFLY

### ISSM and program representatives

The purpose of ISSM is to integrate security into everyday work. The Safeguards and Security Organization therefore provides all employees as much information as possible on how to work securely, as well as mechanisms to give ISSM feedback on security. There are three main tools to help you use ISSM:

- The S&S Organization Website (<http://www-r.llnl.gov/securityprogram/>).

- The Security Help Desk (2-0100).
- Program Security Representatives—security contacts in the field.

The Program Security Representatives, who are deployed throughout the Laboratory, are an especially valuable tool. These security experts are a great source of information for security issues and questions, and they are also knowledgeable about the program environment in which you work. Not only do they represent Lab security to the programs, but they also want to hear your ideas on security.

To find out who your security program representative is, call the Security Help Desk or go to the Security Reps Website (<http://www-r.llnl.gov/securityprogram/rep/>).

### Salary listings available

Employee salary listings are now available in the Benefits Office. There is no charge for the listing but there is a limit of one per customer. The Benefits Office is open from 8 a.m. to 4:45 p.m.



## NEWS YOU CAN USE

# Chambers elected fellow of acoustical society

David Chambers of Electronics Engineering has been elected a fellow of the Acoustical Society of America for his contributions to time reversal processing methodology.

Time reversal processing exploits the property that focusing of waves onto a point looks like the time-reverse of radiation from the point. This symmetry of wave propagation persists even when the propagation medium badly distorts or scatters the waves, according to Chambers, who works in the Defense Science Engineering Division.

"This insensitivity to medium distortion has created a great amount of interest in time-reversing array sys-



David Chambers

tems and signal processing techniques in the acoustics community, with applications to underwater imaging, communication, ultrasonic characterization, and medical imaging," he said, noting that other researchers are applying these techniques to seismic and radar imaging, and radio communications.

Currently, Chambers and Sean Lehman have a small Defense Advanced Research Projects Agency (DARPA) project to apply time-reversal imaging techniques to radar imaging in

highly cluttered environments.

Originally hired at the Laboratory as a physicist, Chambers later moved to Electronics Engineering and worked on ocean acoustics and broadband acoustic beam design for ocean applications. That led to research in acoustic tomography, imaging, and acoustic time reversal.

Chambers has published papers in the fields of laser propagation through turbulence, evaluation of techniques for extracting coherent structure information from turbulent fluid flows, models of dispersive wave propagation for signal processing applications and acoustic time reversal.

In addition to ASA, Chambers is a member of the American Physical Society, Society of Industrial and Applied Mathematics, and IEEE.

## Technical Meeting Calendar

Friday  
**23**

### RADIATION DETECTION CENTER

"Highlights from the DTRA Nuclear Detection Technology Workshop," by Page Stoutland, Tom Gosnell, Bill Craig and Dan Dietrich. 10:30 a.m., Bldg. 151, room 1209 (uncleared area). Contact: Ron Wurtz, 3-8504, or Christie Shannon, 3-6683.

### CHEMISTRY & MATERIAL SCIENCE

"Spin Resolved Photoemission Spectroscopy for Studying Nonmagnetic Materials," by applicant Sung-Woo Yu. 3:30 p.m., Bldg. 235, Gold Room. Coffee and cookies will be served at 3:20 p.m. Contact: Tom Felter, 2-8012, Rebecca Browning, 2-5500, or Jim Tobin, 2-7247.

### INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"Obscured Galaxy and SMBH Formation," by Chris Carilli, National Radio Astronomy Observatory. Noon, Bldg. 319, room 205. Contact: Wil van Breugel, 2-7195, or Sharon Taberna, 3-6290.

### NATIONAL IGNITION FACILITY

"Process Improvement Methods for World-Class Production Readiness," by Ivan E. Araktingi, Exotic Electro-Optics Inc. 10 a.m., Bldg. 482, room 1360 (uncleared). Contact: Andrew Winter, 2-0747, or Adrian Miller, 2-2843.

### INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Type-Based Specialization in a Telescoping Compiler for MATLAB," by Cheryl McCosh, Rice University. 10 a.m., Bldg. 451, room 1025 (property protection area). Contact: Bronis de Supinski, (CASC) 2-1062, or Leslie Bills, 3-8927.

Monday  
**26**

### BIOSECURITY & NANOSCIENCES LABORATORY

"Application of Molecular Biology Technologies to Environmental Microbiology Studies," by Staci Kane, Environmental Restoration Division. 2 p.m., Bldg. 151, room 1209 (uncleared area). Contact: Sonja Letant, 3-9885, or Brynn Bollinger, 2-6637.

### INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"On the Farm: Parallel Smalltalk for Simulating Dairy Operations," by Elizabeth Post, Lincoln University, Canterbury, New Zealand. 10 a.m., Bldg. 451, room 1025 (property protection area). Contact: Pat Miller, (CASC) 3-0309, or Leslie Bills, 3-8927.

### UNIVERSITY RELATIONS PROGRAM

"Active Assembly of Nano-Materials by Motor Proteins," by Andrew Boal, Sandia National Laboratories, Albuquerque, as part of the two-day interview process for the Lawrence Fellowship. 10 a.m., Bldg. 319, conference room 205. Contact: Rich London, 3-2021, or Brenda Foster, 3-8257.

Tuesday  
**27**

### RADIATION DETECTION CENTER

"A Prototype Neutron Spectrometer Based on Single Crystal CVD Diamond," by Greg Schmid. 11 a.m., Bldg. 151, room 1209 (uncleared area). Contact: Ron Wurtz, 3-8504, or Christie Shannon, 3-6683.

### ENERGY & ENVIRONMENT DIRECTORATE

"Status and Future of Nuclear Science and Technology in the U.S.," by Larry Foulke, American Nuclear Society, consultant in Reactor Physics at Bettis. 10:30 a.m., Bldg. 170, conference room 1091. Contact: Doug Vogt, 3-7798, or Marilyn Elkins, 2-4950.

### INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"DOE Safety Software Quality Assurance Implementation Plan," by Debra Sparkman, CADSE. 2:30 p.m., Bldg. 451, room 1025 (property protection area). Contact: Terri Mendoza, (CADSE) 4-3557, or Leslie Bills, 3-8927.

Thursday  
**29**

### H DIVISION

"Theory of the Thermal Properties of Plutonium," by Walt Harrison, Applied Physics Department, Stanford University. 10 a.m., Trailer 2128, room 1000 (controlled area). This is an unclassified seminar. Contact: John Moriarty, 2-9964, or Darlene Klein, 4-2868.

Friday  
**30**

### CENTER FOR GLOBAL SECURITY RESEARCH

"Nonproliferation and Regime Change," by Robert S. Litwak, director, Division of International Studies, Woodrow Wilson School. 10 a.m., Bldg. 132 South, Homeland Security Organization, Summit Room 1784. P-cleared attendees welcome. Contact: Tami Alberto, 2-5969.

### INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"HST Ultraviolet Observations of the Central Nebulae in Clusters of Galaxies: Hot News from Cool Cores," by Chris O'Dea, Space Telescope Science Institute. Noon, Bldg. 319, room 205. Contact: Wil van Breugel, 2-7195, or Josie Morgado, 2-7181.

### DEFENSE & NUCLEAR TECHNOLOGIES

ASCI Alliance site visit-Stanford University. The staff of the Stanford ASCI Alliance Center will visit LLNL. They will present results achieved as they pursue their ASCI objective of Integrated Turbulence Simulations. Their overarching problem is the numerical simulation of a realistic gas turbine engine. Stanford overviews will begin at 10:15 a.m. in the Bldg. 123 auditorium. Student poster presentations will be in the West Cafeteria at 3:15 p.m.

February  
**4**

### ENERGY & ENVIRONMENT

Postdoc Poster Symposium. E & E postdocs will display posters and discuss their research. All LLNL employees are invited to attend and participate in the voting for best poster. 1:30 p.m., Bldg. 543 lobby area. Contact: Camille Vandermeer, 3-2672

The deadline for the next Technical Meeting Calendar is noon, Wednesday.

Send your input to [tmc-submit@llnl.gov](mailto:tmc-submit@llnl.gov).

## NEWS OF NOTE



## Boyd to retire, Ernst named assistant to the director

Director Michael Anastasio has announced his selection of Kinnon Ernst as administrative assistant to the Director. Ernst will replace Carol Boyd, who will retire Feb. 1, after 23 years at the Laboratory.

"I would like to thank Carol for her significant contributions and dedicated service to the Laboratory as well as the outstanding support she has provided to me over the years," Anastasio said.

"I look forward to Kinnon joining my staff. Kinnon has a broad set of unique qualifications and extensive senior management experience, which make her well-suited to assume this role."

Ernst joined the Lab in 1978 and has held administrative assignments in Biomedical Sciences, the Nuclear Test program, Defense Systems, and the Director's Office, serving in senior management support positions with the Laboratory executive officer, the deputy director for Science and Technology, and most

recently, with the deputy director for Operations.

Boyd has had a career-long association with the national labs starting with college summer jobs at Los Alamos National Laboratory. First hired at Livermore in 1960 as a group secretary in A Division, she left a year later to raise her family.

She returned to the Lab in 1973 and held a variety of administrative assignments in D Division and the Nuclear Test Program where she supported the Nuclear Test director.

In 1982, she took a job managing a contractor group providing word processing, technical writing and court reporting services to A&E at the Nevada Test Site. She returned to Livermore as manager of a classified



Carol Boyd

document reconciliation and data base project.

In 1991, Boyd was selected as the B Division/B Program administrator supporting Anastasio. She became principal administrator to the associate director for Defense and Nuclear Technologies in 1996 and in 2001 became special assistant to the deputy director for Strategic Operations. In July 2002, Boyd became administrative assistant to the Laboratory Director.

A special retirement reception in honor of Boyd will be held in the West Cafeteria Wednesday, Jan. 28. For more information, contact Patti Carter at 2-7401 or carter13@llnl.gov.

### MLK

*Continued from page 1*

the state assembly and as mayor of San Francisco as examples.

But, noting that King would have turned 75 this month, he said the state of the struggle for equality that was King's life work is today a "sad story."

Brown said he suspected that the percentage of students still attending all black schools has not diminished more than two or three percentage points over the 50 years since the 1954 Supreme Court decision overturning the legal notion of "separate but equal."

"Martin would be appalled," Brown said. "We somehow went to sleep. That dream has not yet been realized."

In the 35 years since King's assassination, "we've allowed the school system to be re-segregated."

Opposition to busing from whites and some in the black community has slowed desegregation of schools to a "snail's pace," Brown said, adding that recent court decisions have also served to erode the principle that resources should be equal for diverse school populations in public education. "Dr. King would be very disappointed."

"But there is a ray of hope," Brown offered, noting that even in the "hostile environment" of the current Supreme Court, justices upheld race as a legitimate factor in admissions policies at the University of Michigan in a highly publicized recent case.

"I'm certain other challenges on other subject matter will be coming to the court," Brown said. "If that (Supreme Court) majority will be consistent, then the business of what Dr. King was all about, the reasons why King did what he did and ultimately that which contributed



JACQUELINE MCBRIDE/NEWSLINE

From left: Essay contest winners Cindy Chow and Brittney Tachara are congratulated by Dona Crawford, associate director for Computation. Below dancers from the San Jose Multicultural Artists Guild perform during the Martin

to his death, that will continue to be a part of the body politic, a part of decision making, and a part of the knowledge for those who make these decisions.

"That in every way will be a better revisiting of King's dream," he said in concluding his talk. "I hope we can all be a part of that effort. This nation needs it and deserves it."

Brown began his talk by outlining the evolution of the civil rights movement from the landmark decisions of the Supreme Court in the 1950s to King's leadership in the boycotts and marches of the 1960s. He called King an "awesome, mighty figure" whose leadership changed the direction of the civil rights movement.

Prior to Brown's keynote address, the winners of this year's essay contest, writing on the theme "40 Years Later: Keeping the Vision Alive Through My Actions," read their compositions. This year's winners, Cindy Chow of Dublin High School and Brittney Tachara of East Union High School, received scholarship awards and certificates from Dona Crawford, associate director for Computation.

Songs and dance were performed in honor of King by the San Jose Multicultural Artists Guild. Ralph Howard of the Work/Life Programs Office served as master of ceremonies.

(Editor's note: The winning essays in this year's contest will posted on the Web at <http://www.llnl.gov/llnl/06news/NewsMedia/mlk.html>)





# CLASSIFIED ADS

See complete classified ad listings at  
<https://www.ais.llnl.gov/newsline/ads/>

## AUTOMOBILES

1998 Pontiac Grand Prix SE Sedan, Black Ext. V6, Auto Trans, AM/FM Stereo w/CD, Alarm, Excellent Condition, 105K, \$7,000/OBO (925) 469-0107

2002 - BMW 325Ci, 6cyl, 5spd, Blue, 46k miles, Sport Package, Moonroof, Heated Seats, Xenon Lights, Rear Spoiler. Must See! \$23,900 707-494-6689

1990 - Chevrolet 3/4T custom 7pass. van, captains chairs, all power, cruise, AM/FM cassette, low-pkg, V8-5.7L, excellent condition, 123k mi \$3,900/obo 925-443-8276

1978 - 911 Porsche Targa - Cashmere/Brown, low mileage, great condition. Convertible. \$12K/BO 209-745-0420

2002 - Acura TL Type-S with DVD Navigation, 260HP V6, full pwr, leather, sunroof, new tires, tinted windows, 78K commute miles, 100K Acura warranty, \$20,500 209-470-6971

1967 - Shelby GT 500 (Eleanor) awesome! Complete body off restoration just completed. \$65,000 after 5 pm 209-835-3352

2000 - Camaro SS Hartop, 6-Speed/Hurst, Black/Black Leather, 37k mi., New Tires, extras, asking \$20,900. 925-625-0875

1996 - FORD CONTOUR, GL 79,000 miles Absolute Top condition, Automatic ABS, CRUISE, and more... \$3,875.00 925-895-1890

1988 - Chevy Suburban, 3/4 Ton, 454, 3rd Seat, Runs great. 132K miles, 20K on rebuilt transmission. \$4500 OBO 209-836-4169

1995 - SAFARI Van, SLT, AWD, 8 Passenger, Loaded, All Options, 135k miles, Great for Ski Trips! \$4500.00 B/O. 209-599-4644

1975 - Datsun 280Z, runs great, mechanically sound, needs paint. \$2900 OBO. 209-823-5169

2002 - Toyota Camry XLE, fully loaded, leather interior, 16k miles, Asking \$20,000 925-456-8855

1990 - Acura Integra LS 2-door hatchback. 1.8L 4 cyl. engine, 5 Speed, A/C, Alarm, CD Player, 170K highway mi. New tires. Good Condition. \$ 2800.00 209-823-3060

1996 - FORD Thunderbird, all power, pearl white, 96K miles, good condition \$3500 925-516-0353 or 925-443-2114

1998 - VW Beetle, blue, 50K miles, PW, PL, CC, A/C, 5 speed 925-433-5534

1995 - Saturn SC1, 85K miles, AC/CC/PW, Sunroof, Great condition, \$3150 OBO. 925-487-9368

1984 - MAZDA RX-7 GSL; hi miles car, low miles engine; exc body, reg PM, 10-CD changer, 15 yrs of svc records, runs great! \$1500 firm. 408-241-2203

## AUTOMOBILE ACCESSORIES

Brand New Bed liner for Dodge Dakota Club Cab (fits 1997 thru 2004) \$250.00 209-832-3135

New 20x9 chrome six lug wheels for late model chevy/gmc truck. Model-ice metal #884. \$900.00 209-823-8237

## BICYCLES

Burley tandem trailer. 5 years old, exc condition. Kids have outgrown it. This sells for over \$300 new. Asking \$125. 925-606-0755

## BOATS

READY for Fish-99 Skeeter SX186, Yamaha 130, low hours, 2 Lowrance fish finders, ZX55 MotorGuide, very clean. Gray int. Wht/Teal/blk ext. \$11,000/obo 209-840-0166

Kayak SeaScape2 (2-3 person) complete set of accessories included \$800 Yakima racks and saddles \$100 925-449-1270

19ft fiberglass boat with canopy, bumpers, trailer, good working cond. Owner, Rick (reclaiming driveway) BO 209-836-2737

Chrysler 9.9 outboard motor w/gas tank, needs work \$100.00 OBO 209-239-2639

## ELECTRONIC EQUIPMENT

17in MONITOR for Sale! Viewsonic EA771 (1280x1024) w- built-in speakers for \$45. 707-494-6689

Very unique hanging light fixture. Antique

looking. Just 15.00. 510-537-7222

Mitsubishi 20 inch color TV with remote. It is old but it works great. \$20 925-484-4099

IBOOK/Laptop new 10-02, 15 GB hard drive, 128mg memory, cd-rom, 500 mhz, kensington carrying case, OS9/10 CDs included, new \$1299, price \$700 925-447-8236

RedHat Fedora Pentium 300mhz computer. 10GB harddrive, cdrom, mouse, keyboard, etc. Great box to learn on. 150obo 925-455-0847

300 CD CHANGER for home stereo w/ remote, RCA CD9500. Std. RCA jacks or optical digital output. In box w/ manual. Excellent cond. \$60. 925-634-2762

Apple Personal Laserwriter 320 Postscript printer with localtalk to ethernet adapter. One owner. \$50 OBO. 925-736-8992

Sansui XL 500 Tower Speakers. 93db/W, 27-40,000hz, 320W, Excellent Condition. Have specifications. Call in the am. \$300.00 209-836-3041

Lexmark ink jet printer cartridges. Never opened color(15MO01 20) black(12A19 70) \$10 ea. 209-239-2639

## GIVEAWAY

Pit Bull Puppy. 10 weeks. Free to good home. 925-455-8526

2 each ladies bowling balls, one 9# and one 10#: Lawn mower, Snapper rear bag, old but works well. 925-449-9294

Trundle Bed Frame, fits twin mattress. Great condition. 925-484-0697

Dresser, 6 drawers, blue, white top, good condition, 1 drawer needs painted. 925-606-6599

FREE ! GE stereo and old Hi Fi record players, Kinda works, good for parts, cabinets in good condition, will deliver to Livermore. 209-847-1231

## HOUSEHOLD

DINING SET. Tbl top- 4in. wood border surrounds 4in. dk. grn tiles. Chairs-6, dk. grn backs with matching wood seats. Nice looking. \$175 obo. 925-454-8518

Leather sofa, chair and footstool. Dark Green...like new \$1000 510-427-0658 510-427-0658

Oak Entertainment Center L=55in, W=17in, H=55in. Fits 32in TV, lots of room for other components. \$50. 209-599-0922

Tall white cabinet w/4 cabinet doors. Multiple shelves with 2 smaller cabinet doors on top & 2 larger on bottom. Like new, call for photo - \$50. 510-396-8097

China cabinet - Country French, wood, medium color. Picture available, very nice cond. \$400.00 925-443-9110

Dining Room Set. Solid Medium Oak. 8 chairs, 2 buffets, 1 china cabinet. \$2000 or best offer. 510-427-0658 510-427-0658

Bunk Bed - White, steel, Twin/Twin nearly new condition with or without mattresses - \$100. 925-243-1475

Bar-Antique wood with Brass top and foot bar. Two shelves on back side. Fun for someone that entertains. You must pick up in Modesto, \$250.00 obo 209-484-5816

Twin Bed for girl. Adorable, pink, blue & white. House Bed by Little Tykes, pillars, roof, and shutters. New condition. Ask \$125, pd \$300. 925-634-8658

OAK TV ARMOIRE, 41.5(w) x 24(d) x 78(h). \$400; OAK TV STAND, 28.5(w) x 16.5(d) x 36.5(h), \$75. Can email photos. 209-576-7560

Antique mahogany coffee table. Has claw foot curved legs. \$60 925-484-4099

Deep Freeze, Kenmore, 15cf, Works great, \$40, Brinkman Charcol Smoker, \$15 925-828-6737

BEDS-twin set w/headboard/frame \$50, and a full set w/frame \$50. Hardly used. 209-833-1201

Oak computer desk, armoire, bookshelf, tv stand, country style hutch, matching table. All in great shape call for info 925-978-0808

Washer and Dryer, Kenmore, \$175. Very old drill press, \$20. 925-455-4057

Prima Pappa Highchair, Neptune Blue. 1 yr. old, excellent condition. Tons of features. Retains for \$159.99 at Babies R Us. Asking \$95. 925-455-4208

TODDLER BED with a mattress, excellent condition, birch color, \$80; 925-455-4947

Microwave oven. Works great. \$30 925-449-0611

Spring Rocking Horse. Excellent condition. \$20 925-484-0697

Dining set. Heavy solid oak table, two leaves. 6 chairs roll, swivel, recline, rose fabric. \$600 925-828-3143

WASHING machine \$50 obo, TWO matching couches \$100, beige & mauve, good condition. Call for details 925-960-1743

Couch and love seat set, dark rust, corderoy excell condition \$150 and \$120 925-449-6356

Kenmore Gas Dryer 70 series extra capacity, white w/light blue trim, in new condition. Pics available on internet. 150.00 925-783-5607

Stainless top mount sink with Delta faucet. New kitchen does not need it. \$25. 925-606-6599

Solid Oak-Pier Style Queen-Size headboard, overhead lights, drawers/shelving on sides, lots of storage, excellent, condition must sell, moving \$250. 209-475-0405

Couch. Good condition. Light color. \$50 925-443-5213

Girls Daybed w/trundle. Hvy duty white iron (heart pattern) w/canopy \$175.00 209-239-2639

Washer: Whirlpool, white, heavy duty, super capacity, 5 cycle/3 temps. Dryer: Whirlpool Ultimate care, 8 cycle, 2 speed motor. \$250 925-829-1474

## LOST & FOUND

LOST-Ladies watch. Lost-wk before Thanksgiving in B132S parking-lot. Brushed silver with gold-tone highlights, small round face. Sentimental value. 925-373-8414

FOUND: Lab Service Pin. Identify the pin and it is yours. Please call 4-5482.

## MISCELLANEOUS

GARAGE SALE - Sat. Jan 31, 9 AM-4 PM. 5422 Wisteria Way, Livermore. A/C window unit, furniture (kitchen, office, bedroom), household items. 925-456-8723

Zymol wax, wash, detail, leather cleaner & conditioner set. New. Paid \$40. \$25. 925-648-0671

Childrens clothes - Gap, Old Navy, etc - 6 mths to 5 yrs. excellent condition. Priced to sell. 925-998-2620

Nintendo 6400 - 3 controllers, connectors and 6 games. Good condition. \$45.00 925-998-2620

Thomas the Train cars, tracks, and structures. Excellent condition and prices. 925-998-2620

Mirrored Closet Doors, 2 each-42 in. W x 94 in. H, 2 each-36 in W x 94 in H, 4 each-30 in. W x 94 in. H. Best Offer. 925-443-1673

San Jose Sharks vs Calgary - January 28th @ 7:30. 3 tickets, \$40 each. 925-449-5519

Janitorial equip. trash cans, ringers, dustmops, buffers, polishers etc. reasonable prices. 209-521-4846

Compressor Sears max psi 125 uses 220 outlet 20 gal tank \$100 925-449-1270

DVDs-Close Encounters, Brotherhood, UHF, Fellowship of the Ring - \$10/ea plus Playlistation 2 Timesplitters - \$20 925-443-8889

pressure washer, craftsman 2200psi/6.75 hp/2.2gpm. low hours but high pressure water manifold is cracked. \$25 925-449-9294

Golf club travel case. Hard sided, green case with built in combination lock in good condition. Asking \$30. 925-455-4208

## MOTORCYCLES

1972 - Honda Trail 70 very good cond 4k miles 2nd owner great for camping or kids 900.00 209-531-1330

1982 - 1982 Yamaha Seca XJ750R Red like new 34K miles \$750 obo. Moving. 925-455-9159

Motorcycle helmet, small, used by my son for dirt bike riding, \$15 925-484-4099

1973 - Honda 250 Needs top end Good condition \$100 925-449-1270

2000 - Honda Nighthawk CB750 700 total

miles, Fairing and Saddle Bags \$3500 Firm Chris Carlson (209) 836-3069 209-836-3069

1980 - Two stored motorcycles. Plz call husband/owner (procrastinator) for details (reclaiming space for garage) 209-836-2737

## MUSIC INSTRUMENTS

Grand Piano, Sherman Clay, with bench. Mahogany. Excellent condition, like new. \$3500 or best offer. 510-427-0658 510-427-0658

1978 Kimball upright piano with bench in excellent condition. Must sell. \$675 925-337-0241

## PETS & SUPPLIES

6 yr old Arab Gelding. Fabulous on trails, started over fences. Very sweet. \$2000/OBO 209-482-3373

Doglog for Medium Size Dog. \$10 925-828-6737

4YO TB Filly 16+H big boned, sound, easy-going-not spooky. Loves to jump. Trailers, clips, ties, bathes, you name it. \$3500. 925-443-1547

Saddle, Sharon Saar endurance, good condition, 15 inch seat, \$600 call late evenings 209-847-1231

## RECREATION EQUIPMENT

Airwalk snowboard boots mens size 9. Used three times. Excellent condition. \$80. 925-600-1817.

Bowflex exercise machine. 1 yr. old. Has all attachments. \$1000.00 707-374-6143

HealthRider - Original Rider w/ computer, three kids, no time, need room. \$200 OBO 925-454-8486

Treadmill with moveable arms for complete body workout. Good condition, just gathering dust at our house. \$75 OBO. 925-455-4208

Convertible jogger/bicycle stroller. Covered. Holds 2 kids. \$20. 925-443-5213

## RIDESHARING

Express your commute, call 2-RIDE for more information or visit <http://www.r.llnl.gov/tsmp>

BERKELEY - Rider/driver needed to complete a four person carpool from north Berkeley. Leave Berkeley at 7 am. Leave LLNL at 4:40 pm. 510-524-8332, ext. 2-5949

Modesto Mall Park & Ride - Immediate Opening(s) Daves Luxury vanpool, captain seats, reading lights cellphone 8-4:45 rider-ship-based fares 209-404-6680, ext. 3-3194

Orinda - Lamorinda carpool seeks 4th rider/driver. Lab hours 8-4:45. Carpool meets near St. Stephens and Hwy 24. 925-253-0498, ext. 2-9823

Modesto - Working 4 10 hr. days? Vanpool Mon.-Fri. Leaves 6 a.m. and returns at approx. 5 p.m. 209-667-2365, ext. 2-8321

Patterson - Vanpool has seats available for 7:30-4:00 shift. Pre-tax transportation & Guaranteed Ride Home Programs available. 209-892-2118, ext. 2-9502

Manteca - 9/80s alternate work schedule. Rider driver needed. Very flexible. Meet at Walmart. 7am to 5pm. 209-825-0326, ext. 3-0631

San Jose/Fremont - 15 passenger van needs riders. Leave San Jose/Berryessa 6:45, leave Fremont/Mission 7:00, arrive LLNL 7:30. Leave LLNL 4:15. Very reliable. 408-272-4612, ext. 2-1940

## SERVICES

Riding Lessons, minutes from work, all ages, all abilities. 510-302-7327

Excellent painting for reasonable rates. 20 years of experience, interior and exterior. Excellent references. 510-537-7222

Fun Loving Day Care Right down the street from the Lab 925-455-5201

remodel/repair, bath/kitchen, windows/doors, dry-rot/drywall repair, small electrical/plumbing jobs. Licenced 925-337-1291

Petsitting In Livermore Area- Experienced, Inexpensive, Trustworthy. Please Call For Details 925-960-1743

## SHARED HOUSING

Livermore - Nice room for rent near Lab. \$600/month plus share utilities plus deposit. No smoking, pets or stereo. Female preferred. 925-443-2288

Livermore - Room for Rent, non smoker \$600/month includes utilities and privileges. 925-449-6898

Livermore - furnished room for rent. Clean/quiet. No pets/no smoking. \$550.00/month. Share utilities 1/3. Deposit. Mature adult. 925-449-1128

Dublin - Room for Rent \$650.00 month + shared utilities. Beautiful home in Dublin with pool and jacuzzi. Non-smokers only, no pets! 925-960-0233

Livermore - 1 room W/private bath and entrance, microwave, refrigerator. No Pets/Smoking, \$650/m, includes utilities. 925-449-5647

## TRUCKS & TRAILERS

1986 - Gold Jeep Cherokee, excellent body, new tires and rims and car alarm, new transmission and alternator. \$1,200 obo needs engine work 925-961-1930

1992 - Ford Explorer Sport, 2WD, PW, PL, CC, 5-speed, AM/FM Cassette, Tinted windows, Good condition, 110,000 mi., \$1900 925-292-0348

1995 - 4X4 Toyota 4Runner SR5, V6, MT, PS, PB, AC, PW, PL, AM/FM cass, cruise, running boards, tow pkg, roof rack, 123K, \$6800 OBO 209-892-0667

1996 - Toyota 4runner Sr5 4x4, 5spd, pl, pw, sunroof, alloys, running boards, cd, am/fm cass, 140,000 miles, good condition, new tires \$8,000 OBO 209-543-0630

1983 - Chevy Suburban 4wd 3/4ton PW/PDL/AC/Rear AC/Tilt Cruise/CD/Towpkg new engine body straight ready for paint \$1500.00 firm 209-531-1330

1995 - 26ft 5th Wheel Trailer, Model 25 5G Prowler (bunkhouse) sleeps 8, very nice w/lots of upgrades. \$9900 - Truck available too. 925-443-8886

2001 - CARDINAL 29 foot 5th Wheel. double slideout, TV, 16i Aluminum wheels, Al trusses, Fiberglass sides, A/C, awn, micro. Loaded! Like new. \$26,000 209-838-7058

## VACATION RENTALS

Lake Tahoe - The Ridge at Tahoe, 1 week available 2/8-15/04, 2 bdrm suite w/all amenities, 209-321-4598

Lake Tahoe - Deluxe studio at Red Wolf Lodge, ski-in ski-out 5 star resort. With full kitchen, opening 4. Feb 22, 23, 24, 25. \$100/night. 925-449-0611

SOUTH LAKE TAHOE - 3 Bedroom 2 bath Chalet, nicely furnished, all amenities, close to all skiing. RESERVE NOW for OPENINGS! 209-599-4644

Pinecrest - Cabin available near Dodge Ridge skiing. 3 bdrm/2 bath, fireplace w/wood, microwave, pool table, level cleared access to covered parking. \$225/wknd 925-449-5513

Mendocino Coast - Ocean View, 4br, 4.5ba, hot tub, NS/pets okay with deposit, quiet, great for multiple family groups 925-455-5942

Arnold - Avail 2-28 to 3-6, 2 bed-2.5 bath, fully furnished, 3 decks, clubhouse incl: pool, spa, sauna, racket ball, billiards \$600/wk or for sale 925-426-8224

## WANTED

WANTED: Paper shredder for light use at home. 925-447-3809

Wanted: Siding-Need help with replacing in the front of the house. Also: fence repair/brick laying. Please leave a message. 925-408-5537

Model Shipwrights interested in joining a Model Boat Club located at the San Francisco Maritime Museum. Call for information. 925-706-7444

## Please note:

Services and merchandise listed in *Newsline* are not guaranteed. It is up to the buyer to scrutinize services purchased.

## AROUND THE LAB



## Completion of Fifth Street brings traffic circulation changes

The Fifth Street Roadway Repair and Re-Route Project is nearing completion with two stretches of Fifth Street scheduled to open to use Monday, Feb. 2, as follows:

- Between West Perimeter Drive and Avenue A.
- Between Avenue B and West Inner Loop.

There will be new permanent stop signs and pavement markings installed on Avenues A and B at the Fifth Street intersections making them stop-controlled streets. There also will be a new stop sign and pavement markings installed at the Fifth Street/West Inner Loop intersection making it a four-way stop.

The last stretch of Fifth Street between Avenues A and B is still undergoing reconstruction. It will be ready to open in late

March. Temporary stop signs also will be placed on Fifth Street at the Avenue A and B intersections. At the opening of the third and final stretch of Fifth Street between Avenues A and B, the temporary stop signs will be removed and Fifth Street will then become a major, non-stop-controlled through-street in both directions.

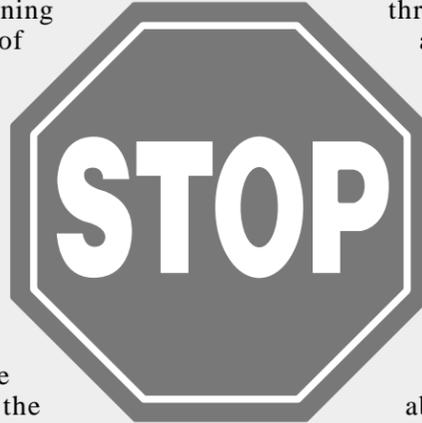
Motorists are reminded that, historically, Avenues A and B have been non-stop-controlled through-streets in the north/south direction. With the opening of Fifth Street as the new connector roadway from West Perimeter Drive to the center of the Laboratory at

West Inner Loop, Avenues A and B will no longer be continuous through-streets. It is

advised that motorists be aware of these new roadway changes and exhibit proper care and driving behavior when approaching the modified intersections.

Always remember, "safety first." If you have any questions about these roadway modifications, contact

Sheree Swanson, 3-5636, or Tim Kemper, 2-1500.



## PEENING

*Continued from page 1*

Ellen Tauscher, Lab scientists and officials, Rolls-Royce executives and Metal Improvement managers are scheduled to speak at the event. In addition, the laser peening process will be shown off to the press.

Due to the deeper compressive residual stress imparted by the laser peening process, components are more resistant to fatigue stress, improving the cost effectiveness of the component's operation in terms of increased life and reduced maintenance costs. Other applications are under development for Rolls-Royce.

Traditionally, metals have been peened by bombarding the material with tiny metal balls known as "shot" to induce a layer of compressive stress at the surface that prevents metal fatigue and reduces corrosion. Metal Improvement is the world's leading provider of outsourced shot peening services for the metal working industry.

Laser peening was invented in the 1970s, and uses short bursts of intense laser light to create pressure pulses on the metal surface, which generate shock waves that travel into the metal and compress it. However, this technology had never been used in production on commercial parts because of its high costs and slow lasers - until now.

Metal Improvement is using an LLNL-developed neodymium-doped glass laser that produces one billion watts of peak power, about the output of a large commercial power plant, in 20-billionth of a second bursts. With 125 watts of average power, the LLNL laser can fire five pulses per second compared with one pulse every four seconds for the best commercially available lasers.

The Livermore laser allows compressive



Jet engine fan blades are currently being treated by laser peening.

stress to be imparted to a depth of 4/100ths of an inch beneath the surface, about four times deeper than conventional shot peening. This added depth is important as a means of inhibiting crack initiation and propagation.

Laser peening may find use in the future for upgrading other commercial aircraft components, such as discs, landing gears, spars, bulkheads and drive gears.

"We can 'surgically' apply laser peening and place compressive stress exactly in the areas that are vulnerable to crack propagation, thus strengthening these components," Hackel said.

"Overall, during the lifetime of all these laser-peened components, we anticipate savings to the aviation industry of hundreds of millions of dollars in reduced maintenance and fewer parts," said Dave Francis, Metal Improvement's executive vice-president for laser peening.

"We've been thrilled with the progress Metal Improvement has made on this technology, and as important as the current applica-

tions are, we believe it's only the tip of the iceberg," said Karena McKinley, the head of LLNL's Industrial Partnerships and Commercialization Program.

In the future, laser peening is expected by Hackel and Francis to be used in other industries, including automobiles and trucks, initially for high-performance race engines; components and structures for high-performance military jets; parts for deep-sea oil drilling equipment; welds for nuclear waste storage containers and for medical devices, such as knee and hip implants.

Livermore's technology for laser peening was licensed to Metal Improvement in 1997 and has been extended through joint research with the company during the past seven

years.

During their collaboration, LLNL's Laser Science and Technology Division and Metal Improvement have won four prestigious R&D-100 awards for developing laser peening-related technologies. Metal Improvement's manufacturing and processing facilities in Livermore, Calif., and Earby, United Kingdom, each have two laser peening systems and about 35 employees.

"We wouldn't have been able to commercialize this technology without the Laboratory," Francis said. "In the early years, we relied heavily on the Lab's technological expertise, but the technology transfer has evolved as Congress intended so that we've developed our own technological expertise, adding new capabilities and jobs to U.S. industry."

A spin off of the Department of Energy's Inertial Confinement Fusion Program, the laser used for peening was developed at LLNL through funding from the Department of Defense, the Defense Advanced Research Projects Agency and the U.S. Air Force for X-ray lithography and satellite imaging research.

## TELLER AWARDS

*Continued from page 1*

“You’ve really helped put this Lab at the top of the mountain in computing,” Anastasio said.

With Santer’s experience in climate model validation and Caldeira’s research in climate and carbon modeling, the duo plan to use the fellowship to evaluate effects of greenhouse gases on global climate using observations and models of the oceans.

“This gives us the opportunity to see what we can do together in terms of research into the effects of humans on the oceans,” Santer said. “Three quarters of the Earth’s surface is made up of oceans and there really hasn’t been that much research into the reality of human effects on climate change in this area.”

### Mike McCoy

McCoy, acting ASCI program leader and department head of the Integrated Computing and Communications Department, has had a long and productive history in the Computation Directorate, beginning with graduate work using the Laboratory’s Livermore Computing Center (LCC) in the mid-seventies. In his final year as a UC Berkeley graduate student, McCoy was supported by LLNL and was exposed to the wonders of the LCC, which at that time featured a number of powerful CDC 7600 computers, all sited in a world-class, innovative, time sharing and interactive computing environment.

This experience with simulation environments shaped his view of the importance of computing both to the scientist and to the health of scientific institutions. Consequently, upon finishing his thesis, he joined a small group of computational physicists at the newly commissioned Controlled Thermonuclear Reaction Computer Center (CTRCC). This center would eventually evolve into the Office of Science’s National Energy Research Scientific Computing Center (NERSC).

At NERSC, McCoy moved from staff scientist to group leader to division leader and finally to deputy director. In 1996, he was offered the role of department head in Computation, where he assumed leadership of the LC and responsibilities to ASCI and the Stockpile Stewardship Program. Also in this role in Computation, he worked closely with Seager and other talented LC technical leaders, including Doug East and Robin Goldstone, to site increasingly powerful computers and computing environments for the ASCI program and, under the Multiprogrammatic and Institutional Computing Initiative, for all Laboratory scientists.

### Mark Seager

Seager, assistant department head for Advanced Technology and ASCI principal investigator for Platforms at the Laboratory’s Integrated Computing and Communications Department, is a recognized leader in tera-scale computing systems architectures, procurement, and integration. More broadly, in the general area of parallel computing, he has played a significant role in developing ASCI’s computing and problem solving environment strategies.



JOSEPH MARTINEZ/IBIS

Director Michael Anastasio (center) with the 2004 Edward Teller Fellowship winners from left: Ben Santer, Mike McCoy, Mark Seager and Ken Caldeira.

He led the highly successful ASCI Blue and White procurements and today leads the Purple procurement process that includes the two most powerful computers in the world, the IBM 100 teraFLOP/s ASCI Purple system and the 350 teraFLOP/s BlueGene/L (BG/L) research system. Seager took a formidable technical role in fostering BG/L and, working with McCoy and Dave Nowak, the former ASCI leader, supported and encouraged the early IBM BlueGene research and development work to the point that the company eventually elected to offer LLNL a huge system as an option within the Purple Procurement.

Working together, Seager and McCoy also developed the computational strategy and integrated architecture for LLNL’s Multiprogrammatic and Institutional Computing Initiative. Seager took the initiative in building long-lasting technical partnerships with many U.S. companies, including Compaq, Linux NetworX and Intel. Under this initiative, they were instrumental in bringing the best cost-effective computing technology to LLNL, making it available to all scientists. This initiative was viewed as being extremely important by the Director’s Office, as high performance computing was rapidly evolving into one of the three essential tools for scientific discovery, joining theory and experiment.

### Ken Caldeira

Since arriving at the Lab in 1993, Caldeira, a member of E&E’s Climate and Carbon Cycle Modeling Group, has become an internationally recognized leader in the fields of climate change and the global carbon cycle. His broad spectrum of research includes predicting the impact of rising levels of greenhouse gases on global climate, obtaining a better understanding of the global carbon cycle and its effects on marine organisms and assessing the role of large-scale ocean circulation in climate change.

Caldeira has also worked extensively on developing new technologies to address the need for finding long-term methods of sequestering carbon dioxide, generated by burning fossil fuels, in the ocean. He is working with power companies to create an experimental testbed for sequestering CO<sub>2</sub> in the ocean that would take advantage of combining CO<sub>2</sub> with seawater, a process that imitates the natural geochemical

weathering processes.

He is also working on projections of future demands for carbon-free energy under various climate stabilization and economic scenarios. Caldeira serves on the U.S. Global Carbon Cycle Scientific Steering Group and acting as the coordinating lead author for the oceans chapter of a special Intergovernmental Panel on Climate Change (IPCC) report on carbon capture and storage.

### Ben Santer

Since 1992, Ben Santer has been a research scientist in the Lab’s Atmospheric Sciences Division where he has played a central role in the Program for Climate Model Diagnosis and Intercomparison (PCMDI). He has investigated statistical methods in climate

model validation, evaluation of climate model performance and detection and attribution of human-induced changes in climate based on models and observations.

Santer has had an impressive career since earning a Ph.D. in climatology from the University of East Anglia, Norwich, U.K.. He became a postdoc then research scientist at the Max-Planck-Institut für Meteorologie.

As an expert in climate modeling, Santer has accomplished many feats including: 1990 contributor to Chapter 8 (Detection of the Greenhouse Effect in the Observations) for the first assessment report of the IPCC; 1994-95 convening lead author for Chapter 8 of the second assessment report of the IPCC — author of the report’s key and quite controversial conclusion: “the balance of evidence suggests that there is a discernible human influence on global climate”; 1995-present member of Science Advisory Panel for NOAA Climate Change Data and Detection Program; 1996-present editorial board for Climate Change; contributor to Chapter 12 (Detection of Climate Change, and Attribution of Causes) of the 2001 third assessment report of the IPCC; 2001-present member of climate modeling advisory panel at the Goddard Institute for Space Studies.

In recognition of his work, Santer has received major awards including the 2002 E.O. Lawrence Award for research in climate modeling, the John D. and Catherine T. MacArthur Fellowship in recognition of his “originality, creativity, self-direction and capacity to contribute importantly to society, particularly in atmospheric science.” He also received the 1998 Norbert Gerbier – MUMM International Award.



Newsline  
UC-LLNL  
PO Box 808, L-797  
Livermore, CA 94551-0808

## IRON

*Continued from page 1*

reports differed in structure and by more than 2,000 degrees Kelvin (3,600 degrees Fahrenheit) at these conditions.

Using LLNL’s two-stage gas gun — which is capable of generating pressures as high as 400 GPa (58 million psi) in the iron sample, a pressure that exceeds the center of the Earth (361 GPa) — physicists Jeffrey Nguyen and Neil Holmes show in the Jan. 22 edition of *Nature* that a shocked sample of iron crosses the melt line at a pressure between those of the core-mantle boundary and the inner-outer core boundary.

“By determining the melting point of iron, we can estimate the temperature at the core boundaries,” Nguyen said. “This information provides us with

another tool to study the temperature of the Earth’s core.”

The Earth is made up of several layers. The first layer is the oceanic or continental crust and is about 20 to 35 kilometers thick. The next layer is the mantle and extends about 2,800 to 2,900 kilometers down to the outer core. The outer core is made of mostly liquid iron and extends from about 2,900 to 5,150 kilometers. The last layer is the solid iron inner core and extends to the center of the Earth at about 6,370 kilometers deep.

Though temperatures in the Earth’s core are extremely high, iron becomes solid because the increase in pressure compresses the liquid iron to a solid.

The boundaries of the liquid and solid iron cores have been determined through studies of seismic waves.